

CLAIMS:

1. A multi-function layout square of modular construction comprising:

an elongate generally rectangular metallic outer casing having first and second ends, first and second sides, a top surface and a bottom surface defining a hollow interior with a longitudinal axis, an elongate longitudinal central slot in each said top and bottom surface near one end thereof parallel with the longitudinal axis of the casing, and a first and a second aperture in each said top and bottom surface spaced from said central slot disposed in longitudinally spaced apart relation;

an elongate generally rectangular non-metallic inner module retained in said casing hollow interior having first and second ends, first and second sides, a top surface and a bottom surface, an elongate longitudinal sliding slot formed therethrough from said top surface to said bottom surface in alignment with said casing central slot, a horizontal level vial and a vertical level vial mounted in said inner module in alignment with said first and second apertures of said casing, respectively;

a retaining member slidably disposed between said casing central slot and said module longitudinal sliding slot;

a removable protractor plate slidably and rotatably disposed on said casing top surface connected with said retaining member, and having an arcuate sliding slot therethrough;

first and second thumbscrews releasably connecting said protractor plate and its said arcuate slot, respectively, with said retaining member to allow linear sliding movement along said sliding slot and variable rotation of said plate about said first thumbscrew member with respect to said casing in a loosened condition and to secure said plate at selected locations and at selected rotated positions along the length of said casing in a tightened condition; and

a scale on each of said casing first and second sides divided into increments with corresponding numerical indicia thereon.

2. The multi-function layout square according to claim 1, further comprising:

a switch aperture in said outer casing top surface;

an on-off switch unit mounted in said inner module disposed beneath said switch aperture and having a switch element accessible in said switch aperture;

a longitudinal bore extending inwardly from one of said first and second ends of said inner module parallel with the longitudinal axis of said casing;

a laser beam emitting unit mounted in said module adjacent to said longitudinal bore and connected in series with said switch unit; and

a battery receiving cavity in said inner module for receiving at least one battery and having battery contacts connected with said switch unit and said laser beam emitting unit;

wherein

when said switch is turned on, a circuit is completed to energize said laser beam emitting unit with polarized DC electrical current to emit a concentrated laser beam coextensive with the longitudinal axis of said layout square extending from said one end, and when said switch is turned off, the circuit is broken.

3. The multi-function layout square according to claim 2, wherein

said inner module comprises a first module removably received in said outer casing hollow interior and a second module retained therein, each having opposed facing ends in abutting relation;

said battery receiving cavity is disposed in said first module, a first one of said battery contacts is engaged on an interior surface of said outer casing, and a second one of said battery contacts is disposed on its said opposed facing end;

said second module has a first metal contact on an outer surface thereof engaged on an interior surface of said outer casing, and a second metal contact disposed on its said opposed facing end to engage said second one of said battery contacts on said first module opposed facing end when abutted therewith;

said on-off switch unit is mounted in said second module and has one terminal connected with said first metal contact;

said longitudinal bore and said laser beam emitting unit are disposed in said second module and said laser beam emitting unit is connected in series with a second terminal of said switch unit; and

when said switch is turned on, a circuit is completed through the metallic outer casing and the battery contact and second metal contact on the opposed facing ends of said first and second modules to energize said laser beam emitting unit with polarized DC electrical current to emit a concentrated laser beam coextensive with the longitudinal axis of said layout square, and when said switch is turned off, the circuit is broken.

4. The multi-function layout square according to claim 2, further comprising:

beam splitting means mounted in said inner module adjacent to said laser beam emitting unit;

a perpendicular bore in said inner module extending outwardly from said beam splitting means perpendicular to said longitudinal bore; and

a bore through said casing axially aligned with said perpendicular bore;

said beam splitting means splitting said laser beam into a longitudinal beam component coextensive with the longitudinal axis of said layout square and a second beam that extends perpendicular to the longitudinal component through said perpendicular bore in said inner module and aligned bore through said casing.

5. The multi-function layout square according to claim 2, wherein

at least one of said thumbscrews has a bore extending longitudinally through its center adapted to receive suspension means for suspending said outer casing vertically therefrom to direct said laser beam onto a surface beneath said outer casing.

6. The multi-function layout square according to claim 1, wherein

said protractor plate is a flat plate with two perpendicular sides with an aperture near the intersection of said perpendicular sides;

said arcuate sliding slot is disposed in radially spaced relation to said aperture and extends through an arc of 90° ; and

said first thumbscrew has a threaded shank extending through said aperture and threadedly engaged with said retaining member, and said second thumbscrew has a threaded shank extending through said arcuate sliding slot and threadedly engaged with said retaining member.

7. The multi-function layout square according to claim 6, further comprising:

seat cut calibrated markings and plumb cut calibrated markings along outer sides of said arcuate sliding slot, and angular degree calibrated markings spaced inwardly a distance from said arcuate sliding slot.

8. The multi-function layout square according to claim 7, further comprising:

a thin flat guide disposed on said protractor plate and connected near opposed ends to said retainer member by said first and second thumbscrews to allow sliding movement of said protractor plate relative thereto and terminating at a pointed end for determining the angle or cut markings at which the protractor plate is oriented with respect to the longitudinal axis of the casing body.

9. The multi-function layout square according to claim 6, further comprising:

a flat raised extension extending along each of said protractor plate perpendicular sides; and

index marks on an outer face of each extension that are aligned and spaced to correspond to the centerlines of the thumbscrews to accurately indicate the location of the protractor plate with respect to the scales on said first and second sides of said outer casing.

10. The multi-function layout square according to claim 9, further comprising:

a permanent magnet mounted in at least one of said raised extensions for attaching said protractor plate to metal surfaces when removed from said outer casing.

11. The multi-function layout square according to claim 6, further comprising:

a series of circular holes of different diameter extending through said protractor plate spaced outwardly from said arcuate sliding slot to receive a pencil for drawing circles or marking widths.

12. The multi-function layout square according to claim 6, wherein

said protractor plate has three angular outer sides spaced outwardly from said arcuate sliding slot extending between diverging outer ends of said perpendicular sides.

13. The multi-function layout square according to claim 12, further comprising:

a series of incrementally spaced notches at predetermined distances along one of said angular outer sides extending from one of said perpendicular sides to function as a depth scale when said protractor plate is removed from said outer casing.

14. The multi-function layout square according to claim 1, further comprising:

at least one permanent magnet mounted in said inner module and engaged with said metallic outer casing to impart magnetic properties to said outer casing and allow attachment of said layout square to metal objects.

15. The multi-function layout square according to claim 1, further comprising:

a mounting aperture in either of said outer casing first and second sides; and
an internally threaded receptacle in said inner module aligned with said mounting aperture for receiving a mating male threaded fastener of a tripod mount to allow attachment of said layout square to a tripod.

16. The multi-function layout square according to claim 1, further comprising:

a semi-circular slot outer casing in either of said outer casing second end and said inner module first end, sized to receive the side of a pencil.